



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Jacobsen, E.N. et al.

Serial No: **10/615,501**

Filed: July 7, 2003

Title: *Nucleophilic Kinetic Resolution of Cyclic
Substrates Using Silyl Azides*

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Group Art Unit: 1626

Examiner: Gerstl, R.

Attorney Docket No.: HUV-020.06
(19787-2006)

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.8(a)

The undersigned hereby certifies that this document is being placed in the United States mail with first-class postage attached, addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on **October 23, 2003**.


Shirine Darvish

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

**INFORMATION DISCLOSURE STATEMENT
UNDER 37 C.F.R. §§ 1.56 and 1.97**

Sir:

Pursuant to 37 C.F.R. §§ 1.56 and 1.97 (b)(3), Applicants submit herewith a Form PTO-1449 including a list of publications. Under 35 U.S.C. §120, the above-identified application has the benefit of the earlier filing date of the following parent applications: **Serial No. 10/206,143** filed on **July 26, 2002**; **No. 09/899,516** filed on **July 05, 2001** now **Patent No. 6,448,414**; **No. 09/134,393** filed on **August 14, 1998** now **Patent No. 6,262,278**; **No. 08/622,549** filed on **March 25, 1996** now **Patent No. 5,929,232**; and **No. 08/403,374** filed on **March 19, 1995** now **Patent No. 5,665,890**. Copies of the documents (References AA-DB) identified in the Form PTO-1449 are not provided because they were previously cited by or submitted to the Patent Office in prior patent applications; therefore, they are not required to be provided in this application. However, Applicants will gladly furnish copies of some or all of same upon request. Applicants

respectfully request that the Examiner consider the listed documents and indicate that they were considered by making appropriate notations on the attached Form PTO-1449.

In compliance with the requirements of 37 C.F.R. §§ 1.56 and 1.97, Applicants have cited for the Examiner's consideration a co-pending U.S. patent application that is owned at least in part by the assignee of this application, which describes subject matter related to the present application. The co-pending application is listed herewith in accordance with M.P.E.P. 609 III.D which states: "Applicants may wish to list U.S. patent application numbers on other than Form PTO-1449 or PTO/SB/08A format to avoid the application numbers of pending applications being published on the patent. If a citation is not printed on the patent but has been considered by the Examiner in accordance with this section, the patented file will reflect that fact as noted in subsection III.C(2) above."

No copy of the co-pending application has been provided. If the Examiner wishes to have a copy of the co-pending application, the Examiner should contact the Attorney of record.

Our Docket #	Serial #	Date Filed	Title
HUV-020.05	July 26, 2002	July 26, 2002	Hydrolytic Kinetic Resolution of Cyclic Substrates

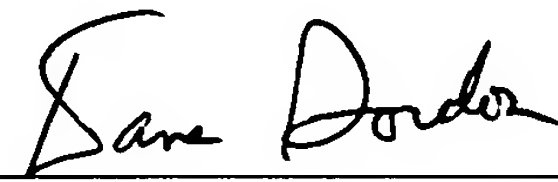
This submission does not represent that a search has been made or that no better art exists. Nor does it constitute an admission that each or all of the listed documents are material or constitute "prior art." If the Examiner applies any of the documents as prior art against any claim in the application and Applicants determine that the cited documents do not constitute "prior art" under United States law, Applicants reserve the right to present to the Office the relevant facts and law regarding the appropriate status of such documents. Applicants further reserve the right to take appropriate action to establish the patentability of the disclosed invention over the listed documents should one or more of the documents be applied against the claims of the present application.

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Under 37 C.F.R. § 1.97 (b)(3), this Information Disclosure Statement is being submitted before the mailing date of the first Office Action on the merits; therefore, no fees are believed to be due. However, the Commissioner is hereby authorized to charge any deficiencies or credit any overpayment from/to our **Deposit Account No. 06-1448, Ref. HUV-020.06.**

Respectfully submitted,
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FOLEY HOAG LLP

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Dated: October 23, 2003

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Form PTO-1449 INFORMATION DISCLOSURE CITATION IN AN APPLICATION <i>(Use several sheets if necessary)</i>	Docket Number (Optional) HUV-020.06 (19787-2006)		Application Number 10/615,501	
	Applicant Jacobsen et al.			
	Filing Date July 7, 2003		Group Art Unit To be Assigned	

U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
AB	3,868,401	02/1975	Aratani et al.	260	468	
AB	4,151,195	04/1979	Warnant et al.	260	465	
AD	4,471,130	09/1984	Katsuki et al.	549	523	
AD	4,538,003	08/1985	Tam	568	656	
AE	4,565,845	01/1986	Inoue et al.	525	25	
AF	4,663,467	05/1987	Kruper, Jr. et al.	549	229	
AG	4,822,899	04/1989	Grove et al.	549	533	
AH	4,870,208	09/1989	Chan et al.	562	579	
AI	4,885,376	12/1989	Verkade	556	18	
AJ	4,594,439	06/1986	Katsuki et al.	549	523	
AK	4,965,364	10/1990	Marko et al.	546	134	

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	Translation	
						YES	NO
AL	EP 0 342 615	Nov. 89	EPO			X	
AM	WO 91/14694	Oct. 91	PCT			X	
AN	GB 2 244 055 A	20 Nov. 91	PCT				X
AO	WO 93/03838	Mar. 93	PCT			X	
AP	WO 96/28402	19 Sept. 96	PCT				X
AQ	P9500057		HU				X

OTHER DOCUMENTS*(Including Author, Title, Date, Pertinent Pages Etc.)*

AR	Adam, W. et al., "Tridentate β -Hydroperoxy Alcohols As Novel Oxygen Donors For The Titanium-Catalyzed Epoxidation of $\nu_1\delta$ -Unsaturated α, β -Diols: A Direct Diastereoselective Synthesis Of Epoxi Diols", Angew Chem. Int Ed, Engl 33(10):1170-1108 (1994).
AS	Adolfsson, H. et al." Chiral Lewis Acid Catalyzed Asymmetric Nucleophilic Ring Opening of Cyclohexen Oxide", Tetrahedron(Asymmetry) 6 (8): 2023- 2031 (1995).
AT	Agarwal, D. et al., "Olefin Epoxidation Using Iron (III) Schiff Base Complexes As Catalyst ", Indian Journal of Chemistry 31A : 785-787 (1992).

EXAMINER		DATE CONSIDERED
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EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

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U.S. PATENT DOCUMENTS

EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	AU	5,093,491	03/1992	Ellis, Jr. et al.	540	135
	AV	5,126,494	06/1992	Gilheany et al.	568	807
	AW	5,250,731	10/1993	Burk	564	150
	AX	5,254,704	10/1993	Takano et al.	549	552
	AY	5,258,553	11/1993	Burk	568	12
	AZ	5,296,595	03/1994	Dolye	540	200
	BA	5,310,956	05/1994	Takano et al.	549	529
	BB	5,312,957	05/1994	Casalnuovo et al.	558	410
	BC	5,321,143	06/1994	Sharpeless et al.	549	34
	BD	5,352,814	10/1994	Katsuki et al.	556	50
	BE	5,360,938	11/1994	Babin et al.	568	449
	BF	5,665,890	09/1997	Jacobsen et al.	549	230
	BG	5,929,232	07/1999	Jacobsen et al.	540	145
	BH	6,262,278	07/2001	Jacobsen et al.	549	230
	BI	6,448,414	09/2002	Jacobsen et al.	549	230

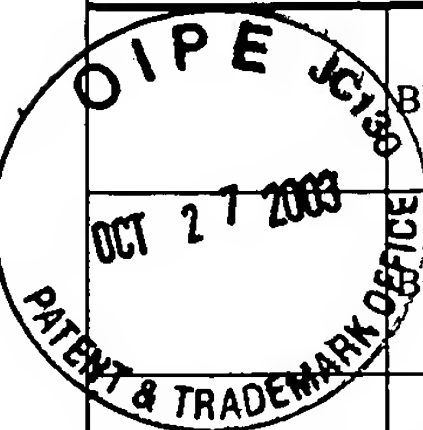
OTHER DOCUMENTS

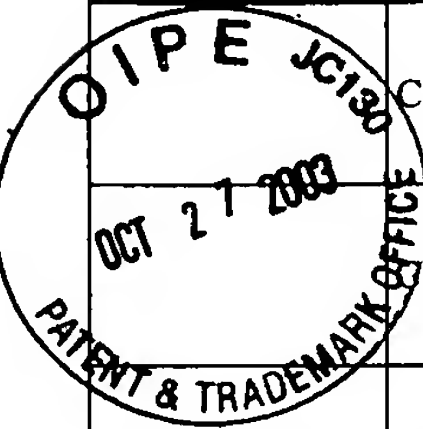
(Including Author, Title, Date, Pertinent Pages Etc.)

	BJ	Barili, P. et al., "Regio- and Stereochemistry Of The Acid Catalyzed And Of a Highly Enantioselective Enzymatic Hydrolysis of Some Epoxyterahydrofurans", Tetrahedron 49(28): 6263-6276 (1993).
	BK	Brandes, B. and E. Jacobsen, "Highly Enantioselective, Catalytic Epoxidation Of Trisubstituted Olefins", J. of Am. Chem. Soc. 59: 4378-4380 (1994).
	BL	Chang, S. et al., "Effect of Chiral Quaternary Ammonium Salts On (Salen) Mn-Catalyzed Epoxidation Of Cis-Olefins. A Highly Enantioselective, Catalytic Route to Trans-Epoxides" J. Am. Chem. Soc. 116 (15): 6937-6938 (1994).
	BM	Chen, X. et al., "Microbiological Transformations 27. The First Examples for Preparative- Scale Enantioselective or Diastereoselective Epoxide Hydrolyses Using Microorganisms. An Unequivocal Access to All Four Bisabolol Stereoisomers", J. of Am. Chem. Soc. 58(20): 5528-5532 (1993).


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OTHER DOCUMENTS <i>(Including Author, Title, Date, Pertinent Pages Etc.)</i>			
	BN	Collman, J. et al., "Regioselective and Enantioselective Epoxidation Catalyzed by Metalloporphyrins", Science, 261:1404-1411 (1993).	
	BO	Collman, J. et al., "Enantioselective Epoxidation Of unfunctionalized Olefins Catalyzed By Threitol-Strapped Manganese Porphyrins", J. of Am. Chem. Soc. 115:3834-3835 (1993).	
	BP	Corey, E. and F. Hannon, " Chiral Catalysts For The Enantioselective Addition Of Organometallic Reagents to Aldehydes", Tetrahedron Letters 28(44):5233-5236 (1987).	
	BQ	Desimoni, G. et al., "Copper(II) In Organic Synthesis X(*). The Importance of Steric Hindrance In The Design of Chiral Tridentate Ligand Copper (II) Catalysts For Enantioselective Michael Reactions(**) Gazzetta Chimica Italiana 122: 268- 273 (1992).	
	BR	Emziane, M. et al., "Asymmetric Ring-Opening of Cyclohexene Oxide With Trimethylsilyl Azide In The Presence of Titanium Isopropoxide/Chiral Ligand", J. of Organometallic Chemistry 346: C7-C10(1988).	
	BS	Groves, J. and R. Neumann, "Regioselective Oxidation Catalysis In Synthetic Phospholipid Vesicles. Membrane-Spanning Steroidal Metalloporphyrins " J. Am. Chem. Soc. 111: 2900-2909 (1989).	
	BT	Groves, G. and R. Neumann, " Membrane-Spanning Steroidal Metalloporphyrins as Site-Selective Catalysts in Synthetic Vesicles" J. Am. Chem. Soc. 109:5045-5047 (1987).	
	BU	Hayashi, M. et al., "Novel Asymmetric Ring-Opening Reactions of Symmetrical N-Acylaziridines with Arenethiols Catalysed by Chiral Dialkyl Tartrate-Diethylzinc Complexes", J. of Chem. Soc. Chem. Commun. No 23: 2699-2700 (1994).	
	BV	Hayashi, M. et al., " Asymmetric Ring-Opening of Symmetrical Epoxides With Trimethylsilyl Azide Using Chiral Titanium Complexes ", Synlett. No 11: 774-776 (1991).	
	BW	Jameson, D. "2,6 Bis (N-pyrazolyl) Pyridines: The Convenient Synthesis of a Family of Planar Tridentate N3 Ligands that are Terpyridine Analogues ", J. of Organ. Chem. 55: 4992-4994 (1990).	
	BX	Jacobsen, E. et al., " Highly Enantioselective Epoxidation Catalysts Derived from 1,2- Diaminocyclohexane ", J. Am. Chem. Soc. 113:7063-7064 (1991).	
	BY	Knebel, W. and R. Angelici, "Kinetic and Equilibrium Studies of Bi- and Tridentate Chelate Ring -Opening Reactions of Metal Carbonyl Complexes ", Inorganic Chemistry 13(3): 632-637(1974).	
	BZ	Krupe, W. and Dellar, D. "Catalytic Formation of Cyclic Carbonates From Epoxides and CO2 With Chromium Metalloporphyrins", J. Org. Chem. 60:725-727 (1995).	
	CA	Larrow, J. and E. Jacobsen, "Kinetic Resolution of 1,2-Dihydronaphthalene Oxide and Related Epoxides Via Asymmetric C-H Hydroxylation", J. Am. Chem. Soc. 116: 12129-12130 (1994).	
CB	Larrow, J. and E. Jacobsen, " A Practical Method for the Large-Scale Preparation of [N,N' - Bis(3,5-di-tert-butylsalicylidene)-1,2-Cyclohexanediaminato (2-)]manganese(III) Chloride, A Highly Enantioselective Epoxidation Catalyst", J. Org. Chem. 59: 1939-1942 (1994).		
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	CC	Leighton, J. et al., "Efficient Synthesis of (R)-4-((Trimethylsilyloxy)-2-Cyclopentenone by Enantioselective Catalytic Epoxide Ring-Opening", Journal of Organic Chemistry vol. 61: No1, pp 389-390 (1996).	
	CD	Li, Z. et al., "Asymmetric Alkene Aziridination With Readily Available Chiral Diimine-Based Catalysts", J. Am. Chem. Soc. 115(12):5326-5327 (1993).	
	CE	Marangoni, G. and B. Pitteri "Crystal Structure of Cationic Square Planar Platinum (II) Complexes Containing The Tridentate Chelate Ligand 2,6-Bis(methylthiomethyl)Pyridine ", Polyhedron 12(13):1669- 1673 (1993).	
	CF	Martinez, L. et al., "Highly Enantioselective Ring Opening of Epoxides Catalyzed by (Salen) Cr(III) Complexes", J. Am. Chem. Soc. 117:5897-5898 (1995).	
	CG	Maruoka, K. et al., "An Efficient, Catalytic Procedure For Epoxide Rearrangement", Tetrahedron Letters 30(41): 5607-5610 (1989).	
	CH	Maruyama, K. et al., "Cobalt Schiff Base Complex Catalysed Solvolytic Ring Opening of Epoxy Compounds", React. Kinet. Catal. Lett. 45(2): 165-171 (1991).	
	CI	Narasaka, K. "Chiral Lewis Acids In Catalytic Asymmetric Reactions", Synthesis, pp 1-11 (January 1991).	
	CJ	Nugent, W. et al., "Beyond Nature's Chiral Pool: Enantioselective Catalysis In Industry", Science 259:479-483 (1993).	
	CK	Nugent, W. "Chiral Lewis Acid Catalysis. Enantioselective Addition of Azide to Meso Epoxides", J. Am. Chem. Soc. 114: 2768-2769 (1992).	
	CL	Oppolzer, W. and R. Radinov, "Enantioselective Synthesis of Sec-Allyl alcohols by Catalytic Asymmetric Addition of Divinylzinc To Aldehydes", Tetrahedron Letters, 29(44): 5645-5648 (1988).	
	CM	Ozaki, S. et al., "Synthesis of Chiral Square Planar Cobalt (III) Complexes and Catalytic Asymmetric Epoxidation With There Complexes", J. of Chem. Soc. Perkin Trans. 2, Issue 1: 353-359 (1990).	
	CN	Palucki, M. et al., "Highly Enantioselective, Low-Temperature Epoxidation of Styrene", J. Am. Chem. Soc. 116: 9333-9334 (1994).	
	CO	Palucki, A. et al., "Asymmetric Oxidation of Sulfides With H2O2 Catalyzed By (Salen) Mn (III) Complexes", Tetrahedron Letters, 33 (47):7111-7114 (1992).	
	CP	Ready and Jacobsen, "Asymmetric Catalytic Synthesis of α -Aryloxy Alcohols: Kinetic Resolution of Terminal Epoxides via Highly Enantioselective Ring-Opening with Phenols", J. Am. Chem. Soc. 121: 6086-6087 (1999).	
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	CCQ	Sasaki, H. et al., "Rational Design of Mn- Salen Catalyst 2: Highly Enantioselective Epoxidation of Conjugated cis Olefins", Tetrahedron 50(41): 11827-11838 (1994).	
	CR	Schurig, V. and F. Betschinger, "Metal-Mediated Enantioselective Access to Unfunctionalized Aliphatic Oxiranes: Prochiral and Chiral Recognition", Chem. Rev. 92:873-888 (1992).	
	CS	Srinivasan, K. et al., "Epoxidation of Olefins With Cationic (Salen) Mn III Complexes. The Modulation of Catalytic Activity By Substituents ", J. Am. Chem. Soc. 108:2309-2320 (1986).	
	CT	Stinson, S. "Chiral Drugs ", Chemical and Chemical Engineering News , pp 46-79 (September 28, 1992).	
	CU	Tokunaga et al., " Asymmetric Catalysis With Water: Efficient Kinetic Resolution of Terminal Epoxides by Means of Catalytic Hydrolysis", Science , 277:936-938 (1997).	
	CV	Ward, R. " Non-Enzymatic Asymmetric Transformations Involving Symmetrical Bifunctional Compounds", Chem. Soc. Rev. 19:1-19 (1990).	
	CW	Woolley, P. "Models For Metal Iron Function In Carbonic Anhydrase", Nature, 258:677-682 (1975).	
	CX	Yamashita, H. "Metal(II) d-Tartrates Catalyzed Asymmetric Ring Opening Of Oxiranes With Various Nucleophiles", The Chemical Society of Japan 61: 1213-1220 (1988).	
	CY	Zhang, W. et al., "Enantioselective Epoxidation Of Unfunctionalized Olefins Catalyzed By (Selen)manganese Complexes ", J. Am. Chem. Soc. 112: 2801-2803 (1990).	
	CZ	Zhang, W. and E. Jacobsen, "asymmetric Olefin Epoxidation With Sodium Hypochlorite Catalyzed by Easily Prepared Chiral Mn (III) Salen Complexes ", J. of Org. Chem. 56:2296-2298 (1991).	
DA	International Search Report completed November 18 1999 and mailed December 12, 1999.		
DB	International Search Report completed 17 July 1996 and mailed 25 July 1996.		
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